

No. 6.—*Pacific Coast Polychaeta collected by Alexander Agassiz.*

BY RALPH V. CHAMBERLIN.

IN 1859 and the early part of 1860 a considerable collection of Pacific Coast polychaetes was made by Alexander Agassiz in the intervals of his work as Aid on the U. S. Coast Survey. The greater part of the material was secured at Mendocino and Crescent City, California, which are on a section of the coast scarcely represented in more recent collections of polychaetes. Other specimens were secured at San Mateo, Calif. and on the Gulf of Georgia, Washington, and a few at Panama. This collection, though of much interest and value, has remained unidentified until the present time with the exception of a number of species of *Nereis* described by Ehlers in his *Die Borstenwürmer* (1864-1868). The following is a complete list of the species in the collection at present identifiable. In addition to the specimens collected by Mr. Agassiz himself, notes upon some material secured by others on the Pacific Coast during or near the same period of time are also included

#### AMPHINOMIDAE.

##### 1. NOTOPYGOS MACULATUS (Kinberg).

*Lirione maculata* Kinberg, Öfvers. K. vet. akad. Förh., 1857, 14, p. 12.

Two large specimens from Panama, one collected by Dr. G. A. Maack on the Darien Expedition and one by C. F. Davis (received M. C. Z. in 1862) are referred to Kinberg's species, the type of which came from the same locality, on the assumption that this type is a very young specimen. Kinberg's account is so meager that, were the present specimens not from the same locality, they would scarcely be referred with much confidence to this species. These specimens are much larger than the type, approaching rather *crinitus* or *splendens* in size. One consists of thirty-three and one of thirty-five segments. The dark maculations and stripes are strongly developed. The Philippine specimens referred by Grube (*Annulata Semperiana*, 1878, p. 8, pl. 1, fig. 3) to this species are not conspecific with the Panama form, as shown by their much simpler branchiae, different coloration, and other features.

## 2. EURYTHOE COMPLANATA (Pallas).

*Aphrodita complanata* Pallas, Misc. zool., 1766, p. 109, pl. 8, fig. 1926.

Numerous specimens of this widespread form from Panama (C. F. Davis, received M. C. Z. in 1862), and Mazatlan, Mexico (H. Edwards, received M. C. Z. in 1873).

## POLYNOIDAE.

## 3. HALOSYDNA INSIGNIS (Baird).

*Lepidonotus insignis* Baird, Proc. Zool. soc. London, 1863, p. 106.

Many deep-colored specimens collected by Mr. Agassiz at Crescent City, in May, 1859. Numerous specimens labeled simply "California, A. Agassiz." A specimen from Sacramento Bay, Calif., was collected by Capt. H. Davis in April, 1859.

## 4. LEPIDONOTUS CAELORIS Moore.

Proc. Acad. nat. sci. Philad., 1903, p. 412, pl. 23, f. 12.

*Polynoe squamatus* Johnson (non Linné), Proc. Calif. acad. sci. Zool., 1897, ser. 3, 1, p. 166, pl. 7, f. 30; Treadwell, Univ. Calif. publ. Zool., 13, p. 181.

Two specimens San Francisco, Calif. (T. G. Cary) and one Gulf of Georgia, Wash. (A. Agassiz).

## HESPERONOE, gen. nov.

Differing from *Antinoe* in having notopodial setae of two very different forms, the more numerous ones much stouter than the neuropodials and a fine, slender, capillary form. Neuropodials also of two forms, the more slender supraaciculars of the *Antinoe* type with the long, fine, smooth tips, and the subaciculars mostly stouter and with tips more approaching the *Eunoe* type. Otherwise agreeing with *Antinoe*.

GENOTYPE.—*H. scnilis*, sp. nov.

5. *HESPERONOE SENILIS*, sp. nov.

## Plate 1, fig. 1-4.

Differing decidedly from *Antinoe macrolepida* Moore, known from the Gulf of Georgia and northward, in having the peaks of the prostomium conspicuously large, pointed, and widely separated. Anterior eyes much smaller than in that species, but little exceeding the posterior. Median tentacle slender, tapered, not more than twice as long as the prostomium measured to anterior ends of peaks; lateral tentacles very much smaller as usual, but little exceed the ceratophore of the median tentacle and shorter than the prostomium. Prostomium longer than wide. Palpi very long and evenly tapered, much exceeding the median tentacle. Tentacular cirri similar in form to the palpi but shorter and proximally more slender; the inferior one thicker than the dorsal. Body ventrally widest near somite XII, from where it narrows evenly and moderately caudad, proportionately much wider than in *macrolepida*, the ventral width much exceeding the length of parapodia exclusive of cirri and setae. No distinct ventral groove. Nephridial tubercles beginning on VII, slender. Elytra overlapping moderately medially and cephalocaudally. Those of first pair circular, the others elliptical; second, third, and fourth pairs broadly and shallowly incurved on anteroectal side, the first of these the most strongly so. Elytra thin, marginally transparent, elsewhere translucent; surface, excepting a narrower border, covered with low, light colored tubercles, each tubercle bearing a dark spinous point; the tubercles not crowded, becoming much smaller on anteroectal part of scale, the posterior ones commonly more or less laterally compressed; edges smooth excepting on external side where there are fine short cilia. Notocirri much exceeding the setae, slenderly and evenly tapered with no subterminal enlargement; cirrophore large. Neurocirri attached distad of middle, slenderly subulate, obviously shorter than the shortest setae. Each ramus of parapodium supported by a single, stout, evenly tapering aciculum, the notopodial stouter than the neuropodial. Notopodial setae numerous but fewer than the neuropodials; the prevalent type shorter but much stouter than the stoutest neuropodials, a few most dorsal ones very short. In addition in the ventral part of the fascicle a number of very fine but longer capillary setae with widely separated teeth along one edge. The supracicular neuropodials are of the *Antinoe* type, being slender with exceptionally long and fine smooth tips. Of the much more numerous subacicular setae the majority are coarser than the supraciculars with tips notably shorter, approaching more the *Eunoe* type. Below these a group of much finer setae with shorter heads set at a greater angle to the shaft. The general color of parapodia and body at present light brown, the body above and below with a paler median longitudinal band; elytra greyish or colorless. Last few segments of body of type missing.

Length to caudal end of twelfth elytra 23 mm.; width to tips of setae, 9.5 mm.; to outer edges of elytra, 7.8 mm.; to bases of parapodia ventrally, 3.6 mm.

*Locality*.—Calif.: San Francisco (A. Agassiz).

*Type*.—M. C. Z. 179.

#### 6. HARMOTHOE IMBRICATA (Linné).

*Aphrodita imbricata* Linné, Syst. nat., ed. 12, 1767, 1, p. 1034.

One specimen from San Francisco (T. G. Cary) and one from Crescent City (A. Agassiz). This is a common species on the Pacific Coast from Alaska to San Diego.

#### APHRODITIDAE.

#### 7. APHRODITA ARMIFERA Moore.

Proc. Acad. nat. sci. Philad., 1910, p. 371, pl. 31, fig. 65, 66, pl. 32, fig. 67-75.

Two specimens of this strongly characterized species were dredged in 22 fathoms of water five miles south of Santa Barbara.

#### 8. APHRODITA LEIOSETA, sp. nov.

This form is close to *A. castanea* Moore, from which it is separated chiefly because of differences in the setae. The upper neurosetae are black, the median ones black or dark brown and the ventrals brown of a usually lighter shade. The neurosetae of the ventral series are from two to five in number, three and four being most common in the middle region of body, as against from six to eight in *castanea*. Three in the middle series and two in the upper as usual. The neurosetae differ from those of *castanea* in being all wholly smooth, with no trace of hairiness at tips, and in being distally more strongly curved, the curvature weakly sigmoidal, with tip less acute, that of the dorsals in particular narrowly rounded. The notosetae are proximally dark or reddish brown but in middle region of length become light and distally colorless. They have the long, soft, slender distal ends characteristic of the *japonica* group though these do not seem to be normally at all hooked. As a whole they are strongly curved and are largely concealed by the felt, the distal portion in all cases normally buried in this. The prostomium is long, somewhat inversely pyriform, being much narrowed proximad; evenly rounded

anteriorly, without distinct ocular peduncles. Eyes on dorsal surface, the anterior farther apart than the posterior from which it is separated by about its radius. Median tentacle very short, clavate. Facial ridge remarkably long, much exceeding the prostomium in length, acutely narrowed anteriorly. Elytra large, overlapping in middle line. Dorsal felt abundant and dense, greyish brown, normally involving and dorsally concealing the neurosetae in dorsal view. Number of somites, thirty-seven.

Length of body proper, 33 mm.; length over all, 38 mm. Greatest width to bases of parapodia, 12.5 mm. Width to tips of neurosetae, 24 mm.

*Locality*.—Calif.: Mendocino (A. Agassiz).

*Type*.—M. C. Z. 14.

#### NEPHTHYDIDAE.

##### 9. NEPHTHYS CAECA (Fabricius).

*Nereis caeca* Fabr., Fauna Groenlandica, 1780, p. 304.

Two specimens from the Gulf of Georgia, Wash. (A. Agassiz).

#### NEREIDAE.

##### 10. NEREIS CALIFORNICA Ehlers.

Borstenwürmer, 1868, p. 553, pl. 23, fig. 2.

Ehlers founded this species on a single incomplete specimen taken by Mr. Agassiz at Mendocino. In the collection I find several additional specimens taken at this locality at the same time.

*Type*.—M. C. Z. 40.

##### 11. NEREIS PROCERA Ehlers.

Borstenwürmer, 1868, p. 557, pl. 23, fig. 2.

Taken in Gulf of Georgia, Wash.

*Type*.—M. C. Z. 155.

12. *NEREIS BRANDTI* Malmgren.

Öfvers. K. vet. akad. Förh., 1865, p. 183.

Sacramento Bay (Capt. H. Davis, April, 1859), San Mateo, Calif., and Gulf of Georgia, Wash. (A. Agassiz).

13. *NEREIS VEXILLOSA* Grube.

Middendorf's Reise nord. u. ost. Siber. Zool., 1851, 2, th. 1, p. 4, pl. 2, fig. 4, 5, 6.

Mendocino, Crescent City, and San Mateo, Calif., and at the Gulf of Georgia, Wash. (A. Agassiz).

14. *NEREIS MENDOCINANA*, sp. nov.

## Plate 1, fig. 5.

In this species the notopodia are simple, none at all enlarged into a large lamellar form bearing the cirrus such as occurs in *brandti* and *vexillosa*. The two lobes of the notopodia are equal throughout. In a considerable number of the anterior notopodia the lobes are thick and conical; but caudad they become more slender and thin in the antero-caudal direction, in the posterior region appearing as simple, short triangular processes. Notocirrus attached at base of dorsal lobe, long and slender or filiform. No postsetal lobe in the anterior parapodia but caudad one becomes evident as a low, but broad, distally straight or slightly convex tip. Lower neuropodial lobe conical, nearly the same size as the notopodial lobes, becoming smaller and more slender caudad. Neurocirri arising from swelling at base of neuropodia, slender, surpassing neuropodial lobe. Anterior region of prostomium triangular with anterior end narrowly truncate and bearing the tentacles which are contiguous, subulate, and shorter than the distance between eyes. Eyes large, the posterior eye on each side in line with the anterior or nearly so, smaller. Styles of cirri short, articulated. In the proboscis I is unarmed. Each II bears nine or ten teeth in a double oblique line. V is unarmed. Each VI bears a few denticles in a central area. On each IV there are ten teeth, of which eight or nine form a curved line while one or two lie on the concave side of this. On the ventral side across VII and VIII run several series of denticles of which those of the most anterior series are fewer, more widely separated and much

larger than those of the more posterior series. Each maxilla with six teeth. Number of segments, seventy.

Length, 33 mm.; greatest width, exclusive of parapodia, 3 mm.

*Locality*.—Calif.: Mendocino (A. Agassiz).

*Type*.—M. C. Z. 2,129.

#### 15. NEREIS AGASSIZI Ehlers.

Borstenwürmer, 1868, p. 542, pl. 23, fig. 1.

Mendocino, Calif. (A. Agassiz).

*Type*.—M. C. Z. 149.

#### LEODICIDAE.

#### 16. LEODICE VALENS, sp. nov.

Plate 1, fig. 6-8.

In the type of this species the branchiae begin on somite V and end on somite LXXX on the right side and LXXVIII on the left. The first and second branchiae are simple filaments; the third are bifid with the two filaments equal; the fourth gills, like the succeeding compound ones, unilaterally pectinate, the branches five in number, each forming an acute angle with base. Caudad of this the number of branches increases to a maximum of ten, the branchiae also longer, when laid against dorsum attaining or extending a little beyond the mid-dorsal line. Farther back they again decrease in length and in number of filaments, and the last seven to nine are simple filaments like those of the first two pairs. Anterior border of prostomium emarginate or incised at the middle between bases of palpi. Anterior lateral tentacle on each side inserted cephaloectad of the posterior and directly in front of the eye. Posterior paired tentacle a little farther forward than the median, the bases of all forming a semicircle. Ceratophores extremely low. Style of median tentacle evenly tapered, not constricted between rings which are cylindrical, long, and about twelve in number. Nuchal cirri nearly reaching anterior edge of peristomium; rings eight or nine, not at all moniliform. Mandibles with anterior plates white, anterior margin of each with two incurvings and three rounded teeth or broad crenulations. Left maxilla II with six teeth; the right with eight of which the most caudal are small; the unpaired or mesal left plate with eight (or nine) teeth. Left maxilla III with six teeth, the right with eight. Notocirri mostly flattened subligulate; the anterior

ones much larger than the posterior; most not showing any distinct segmentation, but some of the anterior ones more or less divided into a long basal segment and usually three smaller distal ones. Neurocirri all thick, short, subconical, and much exceeded by the setae. Shaft of composite setae strongly enlarged distally. Appendage bidentate, the upper tooth erect, the smaller lower one forming a very obtuse angle with it, and nearly at right angles to the axis of the appendage; guard narrow; length of appendage less than once and a half the diameter of the exposed portion of shaft. General color light brown, branchiae paler; no distinct markings. Anal cirri long, slenderly tapered. Total number of segments one hundred and eighty-one.

Length, 140 mm.; greatest width, 7 mm.

*Locality*.—Calif.: Mendocino (A. Agassiz).

*Type*.—M. C. Z. 120. *Paratype*.—121.

#### LUMBRINEREIDAE.

##### 17. LUMBRINEREISZONATA Johnson.

Proc. Boston soc. nat. hist., 1901, 29, p. 408, pl. 9, fig. 93-100.

Several small specimens referred to this species differ from typical larger specimens in wholly lacking brown annulations, being uniform yellow of a slight ferruginous tinge. The crochets and setae are relatively longer than in the type but agree in distribution. One immature specimen from Crescent City and several from Mendocino (A. Agassiz).

##### 18. ARABELLA MUNDA, sp. nov.

The general color light reddish brown with a darker longitudinal stripe, which is not sharply limited, along each side of the dorsum just above the parapodia. Body moderately narrowed from the middle cephalad but much more strongly so caudad, the posterior end being pointed.

This species in some features much suggests *A. attenuata* Treadwell but appears obviously distinct in the structure of the maxillae. These are black throughout. Right maxilla I with seven (six) large teeth, the fang at distal end bent mesad almost at right angle. Maxillae II strongly asymmetrical as in *A. mimetica* Chamberlin. The right plate long and extending proximad down the mesal side of the dental line of I to base of latter; bearing nine or



ten teeth and at anterior end a large curved fang well separated from teeth by a smooth edge. Right maxilla II much shorter, ending posteriorly at anterior end of dental series of I; toothed all the way to anterior fang, there being seven rather blunt teeth excepting the one adjacent to the fang which is much smaller and more acute than the others. The left maxilla II bears six teeth inclusive of the terminal fang, the tooth at the base of which is much smaller than the others, the third tooth from the proximal end largest. Right maxilla III with four teeth, the fang more widely separated because of the obliteration, or nearly so, of the minor tooth adjacent to it in the left plate. Right maxilla IV with four small even teeth. Plate V reduced to a small hook as usual.

Prostomium broadly ovate, more rounded anteriorly than represented for *A. attenuata*; clearly longer than the first two somites together. Eyes in a transverse row across base as usual; the median ones more sharply defined than the lateral ones but much smaller, the reverse of the relation in *attenuata*.

First achaetous segment much longer than the second.

Posterior lobe of parapodia large, projecting caudoectad and also curving more or less dorsad, distally bluntly rounded, always much exceeded by the setae. Setae in middle region of body mostly from five to eight in number in each parapodium. Upper ones with long shafts, strongly bent at beginning of limbate portion, the distal curve gentle. Number of segments in type three hundred and fourteen.

Length, 95 mm.; greatest width, 2.2 mm.

*Locality*.—Calif.: Crescent City (A. Agassiz).

*Type*.—M. C. Z. 211.

#### 19. BIBORIN ECBOLA Chamberlin.

Pomona College journ. zool. ent., 1919, 11, p. 13.

One specimen taken between tide marks on San Miguel Island by W. G. W. Harford. It is a larger specimen than the type, being 135 mm. long and having a maximum diameter of 2.5 mm. though composed of fewer somites,—about two hundred and forty-five as against two hundred and seventy-seven. It is brown in color with superficial iridescence. The prostomium is less pointed than in the type, anteriorly more broadly rounded, though this seems in part due to shrinkage from preservation. The posterior process of parapodium is longer in general proportionately to the basal part of parapodium and to the setae.

## GLYCERIDAE.

## 20. GLYCERA ROBUSTA Ehlers.

Borstenwürmer, 1868, p. 656, pl. 24, fig. 31, 32.

Ehlers based this species upon four specimens forming part of this collection and coming from San Francisco and Mendocino. These types cannot now be found in the collections of the M. C. Z. to which Ehlers states they belong. In the Museum, however, are some finely preserved topotypes from Mendocino (A. Agassiz). Other specimens of the species are simply labeled "California, Capt. Brown." I have found this species not uncommon on Monterey Bay.

## ARICIIDAE.

## 21. NAINEREIS LONGA Moore.

Proc. Acad. nat. sci. Philad., 1909, p. 264.

Several specimens taken at Crescent City (A. Agassiz).

## 22. NAINEREIS NANNOBRANCHIA, sp. nov.

Plate 2, fig. 10; Plate 3, fig. 1.

This form differs from the others known from the coast of California in having the branchiae begin much farther caudad, the first ones appearing on XX to XXIII, and in the marked reduction of the branchiae in the posterior region. The first ones are small and tubercle-like. The others soon increase caudad to stout conical forms, which curve mesad but with those of opposite sides always well separated by a wide mid-dorsal space, and then, in posterior region, again becoming more slender and much shorter. In structure and arrangement of setae most resembling *N. hespera* Chamberlin; but, aside from the very different branchiae, readily distinguishable from that species in the different form of the prostomium, this lacking the anterior median emargination, being simply rounded and as a whole semicircular in outline with anterior end, however, a little narrowed. Postsetal lobe of anterior notopodia larger, subconical, becoming smaller caudad. Postsetal lobe of thoracic neuropodia vertically elongate, but low with edge broadly convex, decreasing

in height caudad; replaced in abdominal region by a small conical process. Thoracic neuropodials in three subvertical series in addition to a ventrocaudal fascicle of longer, capillary cross-striate setae. The coarser setae of the posterior series are continuously narrowed distad with apex narrowly rounded; each abruptly, strongly bent, nearly geniculate, with terminal region long; without serration or cross-ridging on the convex side, but some weak cross wrinkles indicated on the angle on the concave side. Setae of the other two series proximally stout, narrowing abruptly into the usual long, slender, distal region, this with a double curve, strongly finely cross-ridged on the concave side of proximal curve and some distance proximad of this on stouter part of seta. Twenty-six segments in anterior region. Total number of segments in type near two hundred and thirty-seven.

Length of type about 50 mm.; greatest width, 3 mm.

*Locality*.—Calif.: Mendocino (A. Agassiz).

*Type*.—M. C. Z. 2,136. *Paratype*.—M. C. Z. 111.

#### SABELLARIIDAE.

##### 23. SABELLARIA CALIFORNICA Fewkes.

Bull. Essex inst., 1889, 21, p. 130, pl. 7, fig. 3, 4.

Mendocino (A. Agassiz).

##### 24. SABELLARIA NANELLA, sp. nov.

Plate 2, fig. 5-7.

This is a very small species readily distinguishable by the forms of the opercular paleoli. The paleoli of the outer series have long, slender, closely contiguous stems, normally mostly concealed, the free part expanding into broad, colorless, or weakly golden shining blades which narrow a little distad; the distal end finely pectinate with a process or spine toward ventral end of series much longer and stouter than the other. On each side they number twenty-nine or thirty and form a close semicircle spreading out horizontally, *i. e.*, at right angles to long axis of body. The paleoli of the inner series are also arranged in a semicircle with convexity ectad. They are plate-like and contiguous at base but narrow strongly and acutely distad, the tips slightly bent ventrad so that the end appears narrowly truncate. Each blade continues just above base on ectal side into a rounded, short, and broad, process or spur. They number about twenty on each side. The paleoli of the middle

series are expanded above their bases into short broad plates shaped somewhat like the head of an adze with edge of blade ectad and narrowed end mesad, the plates lying contiguously as a pavement or with edges more commonly overlapping, between bases of the other two series of paleoli. They number about twenty-two in each series. The opercular lobes together as a whole are long, strongly expanded distally, in a trumpet-form greatly exceeding the rest of the body in diameter. The parathoracic notopodial paleoli are elongate, thin blades with sides nearly parallel to near tip where they expand a little clavately and then narrow abruptly to an acute apex. The body as a whole is very slender, in all cases with a segment at anterior end of abdomen characteristically globularly thickened.

The greatest thickness of thorax about 1.8 mm., while the width across end of the opercular lobes is up to 1.6 mm.

*Locality*.—Calif.: San Francisco (A. Agassiz). Numerous specimens.

*Type*.—M. C. Z. 2,132. *Paratypes*.—M. C. Z. 482.

## 25. IDANTHYRSUS ORNAMENTATUS, sp. nov.

Plate 3, fig. 2-5.

General color brown. On each side of operculum at about middle of length a large, dark, almost black, spot with a line-like dorsal prolongation to the dorsal furrow. Also a narrow deep colored stripe below the outer series of paleoli on each side. Achaetous caudal region dark anteriorly. Outer paleoli yellow, the inner ones darker, bronze colored. Outer paleoli pinnately branched and the inner ones slender and wholly smooth. Outer paleoli in a series extending around anterior end of inner series, thirty-six in number. Inner paleoli eleven or twelve in each series. Area outlined by the two series on each side very narrow. Papillae below outer paleoli short, conical, well separated, fifteen on each side of which the anterior three are longer than the others. Two pairs of nuchal hooks present in the type. Second setigerous somite with three cirri above setigerous papilla on each side; of these the most dorsal is largest and corresponds in form, size, and position to the branchiae of the succeeding somites; the two below this much shorter, stout, and rounded. The dorsal thoracic paleoli nine or ten in number; not at all clavately widened distad, the plates rather narrow with sides parallel to acutely attenuated distal region, this acuminate region rather long with the narrowing gradual and even, the species in the form of the paleoli being readily distinguishable from *I. johnstoni* (McIntosh) and *I. armata* (Kinberg) which it resembles in the form of the opercular paleoli. Ventral thoracic setae very slender. Uncini elongate and slender, much as in *I. regina* Chamberlin but

with the margin opposite the teeth more strongly and evenly curved and the body moderately widened and strongly rounded at end; bearing eight long, slender teeth. Setigerous somites sixty. The achaetous appendage very short.

Length near 50 mm. Width across thorax, near 5.5 mm.; width across opercular lobes to outer ends of paleoli, 8.8 mm.; to bases of paleoli 5.5 mm.

*Locality*.—Calif.: Mendocino (A. Agassiz).

*Type*.—M. C. Z. 156.

#### CIRRATULIDAE.

##### 26. AUDOUINIA SPIRABRANCHUS (Moore).

*Cirratulus spirabranchnus* Moore, Proc. Acad. nat. sci. Philad., 1904, p. 492, pl. 38, fig. 26-29.

Numerous specimens referable to this species were taken by Mr. Agassiz at Mendocino and Crescent City.

##### 27. CIRRATULUS EXUBERANS, sp. nov.

This species is well characterized by its prostomium. This is short and wide; the anterior margin wide, as a whole but moderately convex, indented on each side of the middle so as to present three large, low lobes or crenations. Anterior, more depressed, region crossed by a single series of eyes, the series continuous, not interrupted in mid-dorsal region, and consisting of twenty-two eyes of which the five in the mid-dorsal region are smaller than those on each side of them. The peristomium dorsally divided into seven or eight short subdivisions by transverse sulci. The special dorsal branchiae in two dense bands on the first setigerous somite, the two bands narrowly separated in the mid-dorsal region, the branchiae in these groups numerous and, like the others very long and forming a dense tangled mass. Other branchiae present nearly to the caudal end, about the sixteen to twenty last segments, however, appearing to lack them. They are situated unusually high on the dorsum in the posterior region, the space between them and the notopodia on each side much exceeding the distance between notopodia and neuropodia, but in the anterior region they come to arise close above the notopodia. Notopodia and neuropodia a nearly uniform distance apart throughout length, more ventrad than

usual. Neuropodial crochets begin on or near segment XXV. Total number of segments in type one hundred and fifty-five.

Length 58 mm.; width 5 mm.

*Locality*.—Panama.

*Type*.—M. C. Z. 1,285.

#### TEREBELLIDAE.

#### 28. PISTA BREVIBRANCHIA, sp. nov.

Plate 2, fig. 1-4.

This species much resembles *P. fratrella* Chamberlin, known from Laguna Beach, Cal., which it approaches in form of the uncini of the several regions more closely than it does *P. alata* Moore. It differs from both these species in having much smaller branchiae with fewer branches and much shorter trunks. There are two pairs, arising on II and III respectively. Of these the posterior much exceed the anterior in size, with the right posterior largest. The anterior branchiae with terminal branches very short, the entire organ in length scarcely equalling that of the trunk of the right posterior. Branchiae of each pair attached close together, trunks nearly contiguous at middle line. Tentacles in a transverse series, attached by contracted bases; short and rather thick but distally moderately tapered. On tentaculiferous ridge above and on anterior surface of peristomial collar-lobes above numerous short papillae. Peristomium with anterior edge produced into a prominent flaring collar with ends widely separated above; deeply emarginate ventrally, leaving the lateral portions as prominent wings. Second somite with anterior edge produced across ventral surface and part way up each side, the wing laterally overlapped on each side by the larger one of III. The latter is scarcely evident, obsolete, across venter, but forms a very prominent wing on each side which rises to a level in front of the setigerous tubercle of IV and thus considerably farther dorsad and mesad than the peristomial collar; the wings are not united across the dorsum, the dorsal surface of III simply depressed below the level of IV. Along the anterior edge of IV on each side also a well-developed wing which, however, is much lower than that of III and does not extend so far dorsad. On V and VI are similar but smaller wings which do not extend half way to the setigerous papillae, and a smaller one on each side of VII. The thoracic setae are distally moderately curved with the limbus on the convex side broad, the other one narrow. As in *fratrella* the uncini show progressively reduced manubria in the anterior double rows as well as in the single rows farther forward. In these there is a distinct rounded shoulder besides at the base of the manubrium on the side toward the neck of the plate.

In the posterior thoracic uncini the base shows a distinct angulation or shoulder at or toward the base of the neck in place of the triangular median process shown in *alata*. This shoulder is also present in the smaller abdominal uncini; it is more abrupt and prominent, less gentle and rounded than in *fratrela* while it is quite absent in *alata*. The beak in the manubriate uncini is more divergent than in *fratrela*.

Greatest width, 3 mm. The specimen incomplete posteriorly. Forty-nine segments in the two pieces present.

*Locality*.—Calif.: Mendocino (A. Agassiz).

*Type*.—M. C. Z. 502.

### 29. EUPOLYMNIA REGNANS Chamberlin.

Mem. M. C. Z., 1918, 48, p. 433, pl. 79, fig. 1-3.

One large and several partly grown specimens of this species were collected by Mr. Agassiz at Panama, the type-locality, where the species is apparently common.

### 30. EUPOLYMNIA CRESCENTIS, sp. nov.

Plate 3, fig. 6, 7.

This species differs from the widespread Indo-Pacific *E. trigonostoma* Schmarda (syn. *P. congruens* Marenzeller) and other previously described species in the form of the uncini. The uncini as compared with those of *trigonostoma* are much more slender, evenly curved, with the beak proportionately longer, reaching nearer to the end of the plate; the subrostral process nearer the end away from the base of the beak, farther removed from tip of beak; the basal projection or shoulder small, much slighter than in *trigonostoma*. Just caudad of the tentaculiferous fold are numerous minute dark eye-spots. Tentacles crowded, numerous and long; slender; each with the usual longitudinal groove. Segmental papillae present only on segments III, IV, and V. Of the thoracic uncinigerous tori the first six bear the uncini in single simple series, the others in a double, interlocking series. Seventeen setigerous somites present. Ventral thoracic plates very wide, trapeziform, the lateral ends being angularly pointed; the anterior ones rather more than twice as wide as the length of the adjacent row of uncini; caudad the anterior margin becomes more decidedly convex; on II, III, and IV they are not set off from the lateral region; these plates roughened; caudad of XVI, plates reduced and longitudinally divided. First branchiae decidedly longer than

the others, the trunks stouter and longer, with two main limbs and a dense brush of terminal branches. Total number of segments in type near eighty-five.

Length, 110 mm.; width of thorax, 11 mm.

*Locality*.—Calif.: Crescent City (A. Agassiz).

*Type*.—M. C. Z. 2,135. *Paratypes*.—M. C. Z. 449.

### 31. SCIONIDES DUX, sp. nov.

#### Plate 3, fig. 9.

As compared with the genotype (*Terebella reticulata* Ehlers) this is a very much larger species easily differentiated as well by various other characters, such as the structure of uncini which, while agreeing closely in more general features, differ in numerous details. These have the basal shoulder more remote from the crest, thus leaving the neck-region longer; the sinus wider at bottom, the beak less divergent from principal axis. Differing from those of *reticulata* decidedly in having the denticles of the crest in five series instead of in four with the teeth of these series more numerous, the larger teeth of the lowermost row, *e. g.*, numbering six instead of only two. There are seventeen setigerous segments, bearing setae of simple limbate type, with no trace of distal denticulations. The uncini begin on the second of these (V); they are in single series on the first six pairs of tori and in a double interlocking series on the remaining pairs. There is a non-setigerous tubercle below each of the second branchiae (somite III), this well developed but much more slender than the setigerous one. Tentacular filaments numerous, closely crowded in a series across anterior edge of fold, flat and ribbon formed, long. No eye-spots observable in types. Peristomium with labial edge below wide and straight, a second edge farther caudad with elongate pit or depression between the two. Branchiae three pairs on II, III, and IV. These ramose, with thick trunks and principal limbs, and numerous fine terminal branches or filaments densely grouped. The third branchiae are inserted obviously nearer together than the second and first. Not differing in length but the second branchiae with more abundant branches. First twelve ventral plates broad, the first ones oblong, the others becoming trapeziform, the subsequent ones very narrow. Plate of segment II longer than that of III and both much longer than those of IV and V, the others increasing in length and decreasing in width in going caudad. Number of segments in type seventy-five.

Length, 125 mm.; width across thorax, 10 mm.

*Locality*.—Calif.: Crescent City (A. Agassiz).

*Type*.—M. C. Z. 2,034. *Paratypes*.—M. C. Z. 228.



Six specimens from Mendocino (M. C. Z. 75) are also referred to this species. They agree closely in most features though the branchiae are shorter and the uncini are apparently slightly more slender.

### 32. THELEPUS CRISPUS Johnson.

Proc. Boston soc. nat. hist., 1901, **29**, p. 428, pl. 17, fig. 175-178b.

Several small specimens of this species were collected by Mr. Agassiz at Crescent City, others at San Francisco, and many at Mendocino.

## SABELLIDAE.

### 33. EUDISTYLIA POLYMORPHA (Johnson).

*Bispira polymorpha* Johnson, Proc. Boston soc. nat. hist., 1901, **29**, p. 429, pl. 17, fig. 179-183; pl. 18, fig. 184, 185.

Five specimens of this form were taken by Mr. Agassiz in the Gulf of Georgia, Washington, and preserved free from their tubes. Three of these are exceptionally large, one having a width across thorax of nearly 20 mm. In addition to these specimens (M. C. Z. 485) there are several specimens *in situ* in their tough cartilaginous tubes (M. C. Z. 486).

### 34. DISTYLIA MONTEREA, sp. nov.

In comparing Mr. Agassiz's Gulf of Georgia specimens of *E. polymorpha* with Johnson's types of that species it was noted that a specimen from Pacific Grove labeled by Johnson as one of the paratypes was not conspecific or even congeneric with the others. In size, form, coloration, and general appearance it is remarkably similar to *polymorpha*, but that it is really generically distinct is at once shown by the fact that the inferior setae of the collar-fascicle are lanceolate instead of spatulate in form. These setae are also much fewer in number than in *polymorpha*. The inferior thoracic setae of the other segments, however, are of the usual spatulate form. Another readily noted difference, which at the same time separates this species from *Distylia rugosa* (Moore), is that there are only seven setigerous thoracic somites instead of eight. Whereas in *rugosa* the eyes are very numerous, approximating one hundred on each radiole, in the present species they are very sparse, most radioles lacking them entirely; when present they are usually two on a radiole

and widely separated, occasionally three. The collar is prominent with the general dorsal opening wider than in *rugosa*, equalling fully three fourths the body width at that level. The dorsal lobes very low in proportion to width. The ventral lobes in the type are widely separated by a V-shaped opening, not contiguous or overlapping as in *polymorpha*. The general coloration is that of *polymorpha*, the branchiae having a similar deep wine-color with lighter transverse bandings distally. Number of segments in type, near two hundred and twelve.

Length without branchiae, 140 mm.; greatest width, 12 mm.

*Locality*.—Calif.: Pacific Grove (H. P. Johnson).

*Type*.—M. C. Z. 1,941.

### 35. PSEUDOPOTAMILLA PAUOPS Chamberlin.

Pomona college journ. zool. ent., 1919, 11, p. 21.

A single specimen, now unfortunately dry, taken at Mendocino, (A. Agassiz) agrees with this species so far as the characters are evident. Previously known from Laguna Beach, Calif.

### 36. PSEUDOPOTAMILLA BREVI BRANCHIATA Moore.

Proe. Acad. nat. sci. Philad., 1905, p. 555, pl. 37, fig. 1-7.

Several dry specimens seem to conform to this species, though the branchiae are rather longer than indicated in the original description. The branchiae agree in structure and number and have the eyes similar in prominence, number, and distribution over the middle half of the radioles. The uncini agree very well, though in those of the sixth segment the neck appears to be a little more slender; the beak and crest together have the characteristic straight anterior edge with the tip of beak slightly bent forward. The specimens were taken at Mendocino (A. Agassiz).

### 37. PSEUDOPOTAMILLA PANAMICA, sp. nov.

Plate 3, fig. 8.

In the type of this form there is a total of sixty-seven somites of which nine (eight setigerous) are thoracic. The branchiae are transversely banded with dark, the banding dusky and not sharply limited. The branchial membrane

crossed longitudinally by purplish lines, one being opposite the interval between each two radioles. On the thorax a broad purplish brown longitudinal band mesad of and more or less embracing the notopodia on each side, a yellow median dorsal stripe between the two dark bands, the latter fading out caudad. Ventral plates pale orange, the anterior thoracic ones darkened at each lateral end, a dark band extending up each side of the first segment and a dark line in front and one behind each of the anterior tori. Ventral lobes of collar not extending much forward, broadly overlapping in the middle line. The dorsolateral incision on each side deep and narrow; each dorsal lobe extending forward beyond the lateral part, oblong, with ectoanterior corner and anterior end convexly rounded, the anteromesal corner subrectangular, the mesal edge a little concave, the ectal gently convex. Free dorsal margins of branchial basal membrane not at all incised or lobed, well separated. No eyes present. Radioles twenty-two on each side, in a simple series. All thoracic plates and the first abdominal one entire, the other abdominal plates longitudinally bisected. Thoracic uncini characterized by an unusually long and erect neck, the lower protruding lobe small, the beak straight and widely diverging. Inferior thoracic setae distally spatulate with a slender acute tip usually curving more or less at an angle with the blade.

Length, 35 mm.; greatest width, 3.5 mm.

*Locality*.—Panama.

*Type*.—M. C. Z. 72.

The tube proper is tough and parchment-like with outer surface densely coated with shell fragments and sand.

#### SERPULIDAE.

##### 38. SERPULA VERMICULARIS Linné.

Syst. nat., ed. 12, 1767, 1, p. 1267.

*Serpula vasifera* Haswell, Proc. Linn. soc. N. S. W., 1885, 9, p. 608, pl. 31, fig. 1, pl. 32, fig. 6-8.

*Serpula columbiana* Johnson, Proc. Boston soc. nat. hist., 1901, 29, p. 432, pl. 19, fig. 199-204.

*Serpula narconensis* Collin, Semon'sforsch. Austr. Malayen archipel., 1902, p. 100.

*Serpula granulosa* Willey, Ceylon pearl oyster fisheries report. Suppl., 1905, p. 316, pl. 7, fig. 186, 186a.

Several specimens of this widespread form, of which the synonymy pertaining to the Pacific region only is given, with their bright white tubes were taken by Mr. Agassiz at Mendocino, and in the Gulf of Georgia, Wash.

## 39. SERPULA NANNOIDES, sp. nov.

## Plate 2, fig. 8.

The present form, as represented by the several type-specimens, is greatly exceeded in size by *S. vermicularis* and *S. splendens*. From both these species readily distinguishable in having the collar-fascia relatively much longer and more prominent, greatly exceeding the following fasciae instead of being smaller than them. Collar-setae stouter and darker than the others and differing in structure as usual; bayonet forms with spurs stouter than in *vermicularis*, rounded. Thoracic membrane at lower end below on each side with two caudally directed, triangular lobes or flaps of which the lower is usually much larger, the upper one sometimes scarcely obvious; on ventral side the collar-membrane protrudes forward at middle where it is simply rounded, not at all incised. Operculum funnel-shaped, thin and less rigid than in *vermicularis*, more or less readily collapsible. Number of crenations along edge of operculum about ninety. Secondary operculum not observed in the types.

Greatest width, near 2.5 mm.

*Locality*.—Calif.: Crescent City (A. Agassiz).

*Type*.—M. C. Z. 511. *Paratypes*.—M. C. Z. 2,131.

## 40. CRUCIGERA HESPERA, sp. nov.

## Plate 2, fig. 9.

The type of this species is notably smaller than that of *C. zygophora* (Johnson) with which it has been compared. It is obviously different in the form of the operculum. The operculum proper is similarly regular but is decidedly narrower, not truly campanulate, the radii not flaring out distally but with their acute apices in a distal median position on each. Radii twenty-five in number. As in *zygophora* there is on one side but a single rounded, ectally flattened or concavely depressed lobe beneath which the distally abruptly constricted stalk is attached. On the other side are two more prominent lobes; these are more widely divergent than in *zygophora* and instead of being straight are distally geniculate, the short apex extending up at right angles to the axis of the basal part and well rounded. Secondary operculum more slender, distally less bluntly rounded than in *zygophora*.

Width across thorax, 2.5 mm. Width across operculum, 1.8 mm.

*Locality*.—Calif.: Mendocino (A. Agassiz).

*Type*.—M. C. Z. 164.

EXPLANATION OF THE PLATES.



PLATE 1.

PLATE 1.

HESPERONOE SENILIS Chamberlin.

- Fig. 1. Notopodial seta of first type.  $\times 152$ .
- Fig. 2. Notopodial seta of second type.  $\times 152$ .
- Fig. 3. Neuropodial seta of first type.  $\times 152$ .
- Fig. 4. Neuropodial seta of second type.  $\times 152$ .

NEREIS MENDOCINANA Chamberlin.

- Fig. 5. Dorsal view of prostomium.  $\times 47$ .

LEODICE VALENS Chamberlin.

- Fig. 6. Composite seta.  $\times 300$ .
- Fig. 7. Mandibles.  $\times 14$ .
- Fig. 8. Maxillae I.  $\times 14$ .





